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Thinking About "Autonomous" Weapons

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The great 19th-century social theorist Max Weber was among the first to describe how science and technology "disenchant" the world we live in. Science and technology replace myths and fables with cold hard facts; customs with rules; kinship ties with economic relationships; and mystery and uncertainty with a quantified universe.

Perhaps nothing was ever "enchanted" about war and the role of the military, but, nevertheless, science and technology have virtually banished the centuries-old military reliance on honor, virtue, courage and duty. Today it is the weapons we deploy which are "smart" and "friendly," rather than our soldiers. It appears that our military at least believes that success in conflict is based less on the virtue and determination of the soldier and the justice of his cause, but on the effectiveness of the weapons he employs. The soldier is no longer an individual political representative of a national will that has decided to risk his life and employ force against others, but is now simply a weapons operator, a small part of a powerful war machine that is employed by a handful of policymakers in Washington.

As a simple weapons operator, the soldier's capacity as a political representative is more a problem than an asset to modern war planners. Dead soldiers are a political liability. Modern weapons have made skill, planning, and courage largely irrelevant—most of our recent casualties have been men who were in the wrong place at the wrong time. To minimize the political liabilities of having men simply slaughtered because they were in an area for "policy" reasons, the Pentagon, for the last twenty years, has tried to keep the people exposed to combat to a minimum, and to supplement those that are left with increasingly deadly weapons. This is advertised as a policy of "nothing but the best" for American soldiers, in order to save lives, but in fact this policy leaves soldiers at the mercy of the reliability of complex high technology weapons systems, with diminishing control over their own fate.

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The Pentagon's capacity to send significant firepower to any spot in the world without having to mobilize a large army or renew the draft also hamstrings the democratic process regarding decisions about deploying force. Representatives of the military-industrial complex have lulled Americans, even policymakers, into believing that the replacement of men with machines is the humanitarian and efficient thing to do in war. Certainly any given soldier would rather stay home and let a robot go in his place. But the overall effect of replacing men with machines is the creation of a fearsome military force without the traditional democratic check of

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Gary Chapman is Executive Director of CPSR. This article is adapted from the chapter, "The New Generation of High Technology Weapons," in the book, Computers in Battle: Will They Work?, *David Bellin and Gary Chapman, eds., Harcourt Brace Jovanovich, 1987. This book is available through the CPSR National Office. References for this article can be found in the book.*

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Kite fear of
"volunteer army"
vs. draftees.

individual soldiers examining the justice and conduct of the war from the inside. Moreover, the nation that is simply "left alone" while its leaders wage war elsewhere is no democracy. As Rousseau once said, "As soon as a single citizen says, 'What is it to me?,' the republic is lost."

The Trend Toward Autonomous Weapons

General William Westmoreland summed up the modern military's goals over seventeen years ago when he said before a congressional committee, "I am confident the American people expect this country to take full advantage of its technology—to welcome and applaud the developments that will replace wherever possible the man with the machine." More recently, Frank Barnaby has written in his 1986 book, *The Automated Battlefield:*

> The Pentagon's goal is to give machine intelligence the job of waging war without human intervention. If the enemy uses human soldiers on the battlefield they will be killed by computerized weapons. If the enemy uses robots and automated machines on the battlefield they will be destroyed by computerized weapons.

Weapons development has been headed in this direction for some time. One of the most illustrative examples is the history of the anti-tank weapon. In World War II, soldiers used the simple "bazooka," a projectile fired from a tube aimed by the operator. The bazooka model was in use from World War II to the late 1960s, when the U.S. began to deploy the TOW missile (for Tube-launched, Optically-sighted, Wire-guided). The TOW missile has a wire that is trailed out the back of the projectile as it travels toward the target. The wire supplies information to a computer that is linked to the operator's sight, so the missile can be steered after it leaves the firing tube. New-generation anti-tank weapons replace the wire with a laser beam. The next generation of development will be so-called "fire and forget" weapons, in which the projectile itself locks onto the target so that the operator is free to engage another target as soon as the projectile is fired. Finally, the operator is replaced with an artificial intelligence system that not only operates the vehicle but identifies targets and destroys them (this has already produced its own terminology, including IFF—the acronym for "Identification of friend or foe"). This is the truly autonomous weapon.

The Pentagon is currently spending about $300 million a year on the development of autonomous weapons. The military has a wide variety of reasons for wanting combat robots, and the most important of these will be reviewed here briefly.

The NATO-Warsaw Pact Balance

The United States and other NATO partners are worried about the dramatic Soviet numerical superiority in Europe in a number of key military resources, particularly in battle tanks. This worry will only increase if there is an agreement eliminating medium-range nuclear missiles in Europe. Currently the Soviets have an advantage of between two and three to one in tanks deployed in Europe, with as many as 50,000 tanks in the Warsaw Pact. NATO commanders are concerned about the possibility of being overwhelmed by a massive Soviet "blitzkrieg" attack.

NATO and government officials are convinced that the Western countries will never match the Soviet Union in production of tanks and other traditional military hardware. It has been estimated that to produce the material required to match the Soviets tank for tank, gun for gun, the United States would have to increase its defense budget by a third, or more than $100 billion per year. The Soviet Union has a comparative advantage in labor and heavy industry, while the economies of the Western countries are moving toward high technology-based manufacturing and services.

The Defense Department has explicitly set forth a policy of developing an arsenal based on computer technology because it is in this field that the Soviets fall furthest behind the West. Soviet computer technology is usually assessed as between five and seven years behind the technology of the U.S., Japan, and Europe, and, moreover, it appears that the Soviet economy is poorly equipped to catch up. The Defense Department is waging a war against technology transfer to the Eastern bloc nations—trying to stop "high tech leaks"—while at the same time moving rapidly to exploit the advantages of the West in computer engineering with increasing levels of funding for research and development. The hope in the Pentagon is that through high technology the NATO alliance will "leapfrog" the Soviets in weapons development, providing the edge that is necessary against the alleged Soviet superiority in Europe.

The Population Dilemma

Another reason military planners are interested in combat robots and other military machines is that the population of young men eligible for military service is declining for the first time since World War II. The Vietnam-era conscription drew on a population cohort larger than any in U.S. history, the "baby boom" generation of post-World War II births. But in 1981, the year President Reagan took office, the steady rise in the population of 18- to 21-year old males reversed itself for the first time since 1945. In 1980, the total population of males aged 15 to 19 was 10.7 million. By 1995, it will decline to 8.6 million, a 20% drop.

In Western Europe the decline in birth rates is even more severe. West Germany has a birth rate of only 1.3 children per woman, the lowest in the world and the lowest in German history. The mortality rate in West Germany is higher than the birth rate, meaning that West Germany is losing population. The West German government has responded with a proposal for extending the term of military service from 15 months to 18. French Prime Minister Jacques Chirac recently commented, "In demographic terms, Europe is vanishing."

The declining birth rates of Western countries means that their populations are growing older. By the year 2000, over half the men in the United States will be over the age of 40, usually considered beyond the age of eligibility for military service. As the population of NATO countries ages, the demand in the private sector for highly-skilled and educated young workers will focus on a smaller population. The military will be competing for young men in a seller's market, as it were. Martin Binkin, an analyst of such trends at the Brookings Institute, has reported that by the early 1990s, at planned military force levels, the U.S. military will need to recruit more than half of the young men not dedicated to college or disqualified from the service. If increased force levels are factored in, the military may need to recruit up to *60 per cent* of this pool.

The policy alternatives facing the military are highly controversial and politically risky, such as reinstating the peacetime draft, putting women into combat jobs, and paying skilled personnel at levels comparable with the private sector. A less controversial policy alternative, however likely to succeed, is to follow the rhetoric of American business and replace workers with machines.

Robot Capabilities

Another important reason the military is considering the use of combat robots is that robots are capable of operating in environments where humans cannot. Not only could combat robots be designed to withstand high velocities, tremendous shocks, extraordinary temperatures, and so on, but, perhaps most important in the context of modern arsenals, robots could operate in combat zones contaminated by nuclear, biological, or chemical weapons. The most significant drawback to the use of such weapons, from a military point of view, is that they are just as deadly to one's own troops as they are to the enemy. Chemical weapons, for example, fell out of favor after World War I because their dispersion could not be adequately controlled and they just as often affected friendly forces as the enemy. Very few commanders are confident that the advanced protection measures employed to protect soldiers from these agents will actually do much good. Robots, however, could operate in environments even heavily contaminated by nuclear blasts. One Army document even proposes development of a robot to pick up the dead after a nuclear war.

But the human soldier may have difficulty operating in the modern combat environment even if nuclear, biological, and chemical weapons go unused. Current developments in weapons may make the future battlefield too lethal for human soldiers. For example, a missile system under development by the U.S. Army, popularly known as "the grid-square buster," can saturate a 600-square meter area with 12,000 individual high explosive bomblets, and, sometime in the future, each of these bomblets will be terminally guided by an on-board system that will direct the explosives right to their targets. Very little could survive such an attack.

Psychological research conducted by the military strongly suggests that no military unit can sustain

10% or more casualties in the course of a single operation without seriously compromising the sanity of the survivors. Modern weapons, however, may be capable of wiping out entire units in a single blow, or, at best, leaving a handful of stunned and helpless survivors. The horror and speed of future combat may be too much for people, even after the Battle of the Somme and the Northwest Pacific battles of World War II. Robots may be the only way to deliver force in a future war.

The Dangers of Autonomous Weapons

One does not need to dwell on the moral dilemmas posed by giving machines not only the capability but the assignment of killing human beings in order to object to autonomous weapons. The moral problems of such machines are immediately obvious. In fact, as I have argued elsewhere, they may be illegal under the agreements concerning war crime law that the United States has signed. There are three pillars of international war crime law, all three of which are toppled by the deployment of autonomous weapons: war may not be waged outside of "military necessity"; no harm should come to noncombatants, as far as is possible under the circumstances; and war cannot be waged so that the enemy is given no chance to surrender. It is impossible to build a machine which can comply with these requirements concerning the just use of force.

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There are many other dangers in the development of autonomous weapons. A military that bases its effectiveness on the use of such weapons is highly vulnerable. No one can know how well they will work until a war starts. If they work as well as the promises claim, military officers might not have anything to worry about. But the record of performance of most of our high technology weapons is nothing to inspire confidence, and if the military is actually faced with a serious attack, a disaster could set in with no way out.

The proliferation of rudimentary technology necessary for the development of autonomous weapons could have serious implications for peace worldwide. Already we are gravely concerned about the appearance of U.S.-made Stingers, an effective, hand-held anti-aircraft weapon, in Iranian hands. Think of the difficulties we might face if the World War I-vintage mines in the Persian Gulf had relatively simple microprocessors in them that made them maneuverable, perhaps with homing capabilities. Ironically, the United States seems bedeviled by small countries using technology that is well-proven and small-scale, while our own military suffers defeats because it uses risky, state-of-the-art, unproven technologies—technologies that will eventually filter down to hostile forces in a more reliable form. ?

Another, overlooked danger is that, like most military technologies, autonomous weapons could find their way into domestic use. Already we are seeing the rapid expansion of private prisons, which are run at a profit by cutting labor costs through the use of high technology system. One Texas prison supply manufacturer as purchased over $200 million worth of security robots. These robots may roam the halls of prisons in place of guards, some of them even equipped with mace to deal with inmates. It should be a serious issue of public philosophy to lock up human beings and have them guarded by machines, but such developments are usually discussed only in economic terms.

Finally, the use of autonomous weapons should raise profound questions about our political philosophy. Just as the use of robots in factories has made some people wonder what jobs are really for—producing goods or allowing people to live productive and meaningful lives—the use of autonomous weapons should make us stop and reflect on why and how we deploy force. If it is become true that war, because of modern weapons development, is too lethal even for humans to fight, then we should recognize the deep, fundamental irrationality of our current system of providing for national security. ? If we stop to think about the monstrous crime of sending a person to his or her maker by a machine which can have no regret, no sense of historical tragedy, or any sense of empathy and despair, ? then maybe we will think more concretely about the world we are leaving to our children, a world that should be free of such nightmares, one where we instead devote our best intellectual skills and our greatest financial resources to building peace and understanding. □